Labor Input Price Indexes
Local Exchange Carriers and U.S. Economy
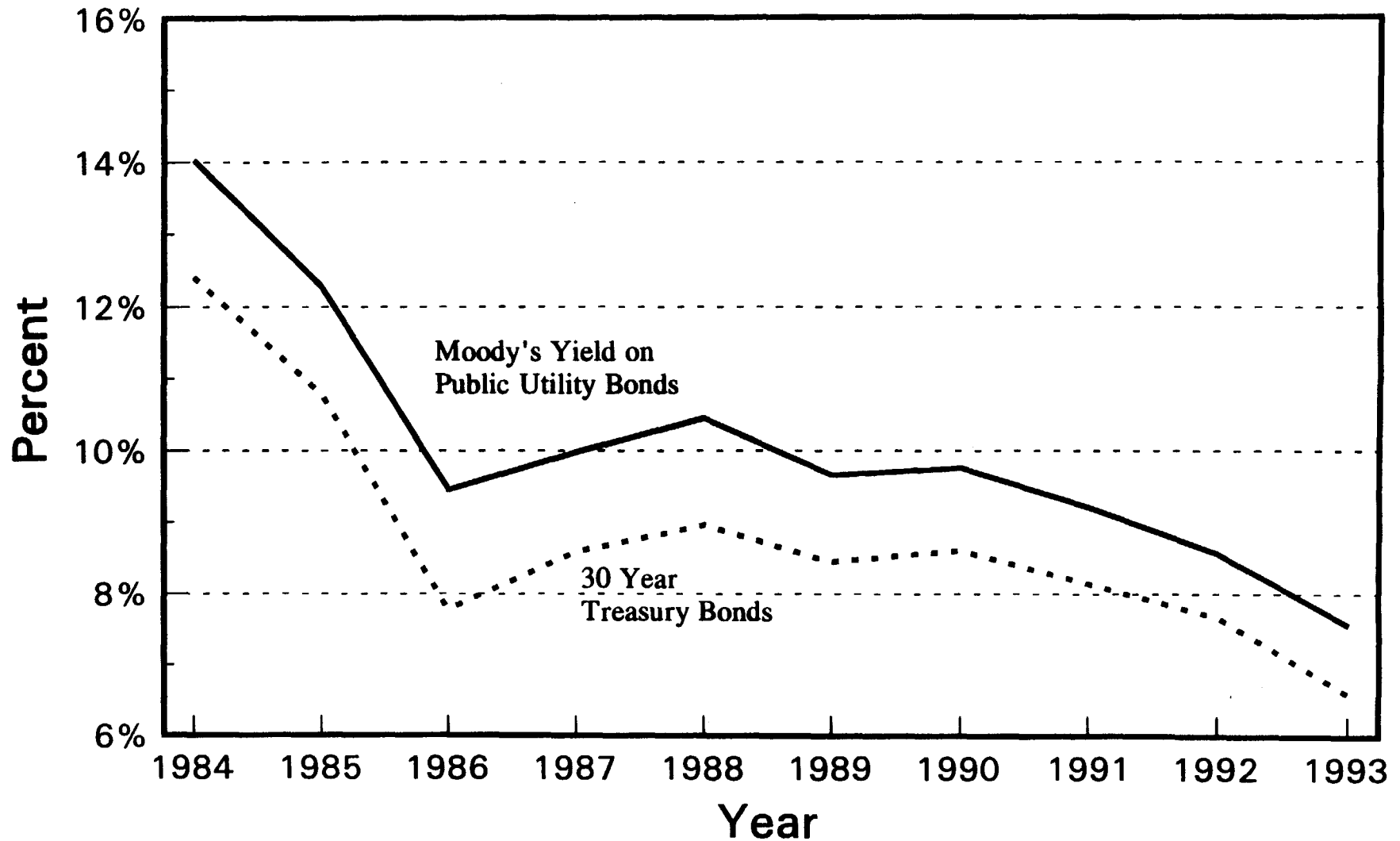## 1984-1993

	U.S. Economy	% Change	Local Exchange Carriers	% Change
1984	1.000		1.000	
1985	1.039	3.8%	1.056	5.4%
1986	1.073	3.2%	1.114	5.4%
1987	1.108	3.2%	1.105	-0.8%
1988	1.162	4.8%	1.099	-0.6%
1989	1.218	4.7%	1.128	2.6%
1990	1.274	4.5%	1.208	6.9%
1991	1.330	4.3%	1.278	5.6%
1992	1.376	3.4%	1.338	4.6%
1993	1.426	3.6%	1.478	9.9%
Avg 85-93		3.9%		4.3%
Avg 91-93		3.8%		6.7%

U.S. Economy Labor Input Price Index: Employment Cost Index, Total Compensation, Private Industry; Economic Report of the President, February 1994, Table B-46.

Local Exchange Carrier Labor Input Price Index: L. R. Christensen, P. E. Schoech, and M. E. Meitzen, "Productivity of the Local Operating Telephone Companies Subject to Price Cap Regulation, 1993 Update," Christensen Associates, January 1995.

Exhibit E
Moody's Yield on Public Utility Bonds
and 30 Year Treasury Bond Rates

Moody's Composite Yield on Public Utility Bonds and 30 Year Treasury Bond Rates 1984-1993

Moody's Composite Yield on Public Utility Bonds and 30 Year Treasury Bond Rates
1984-1993

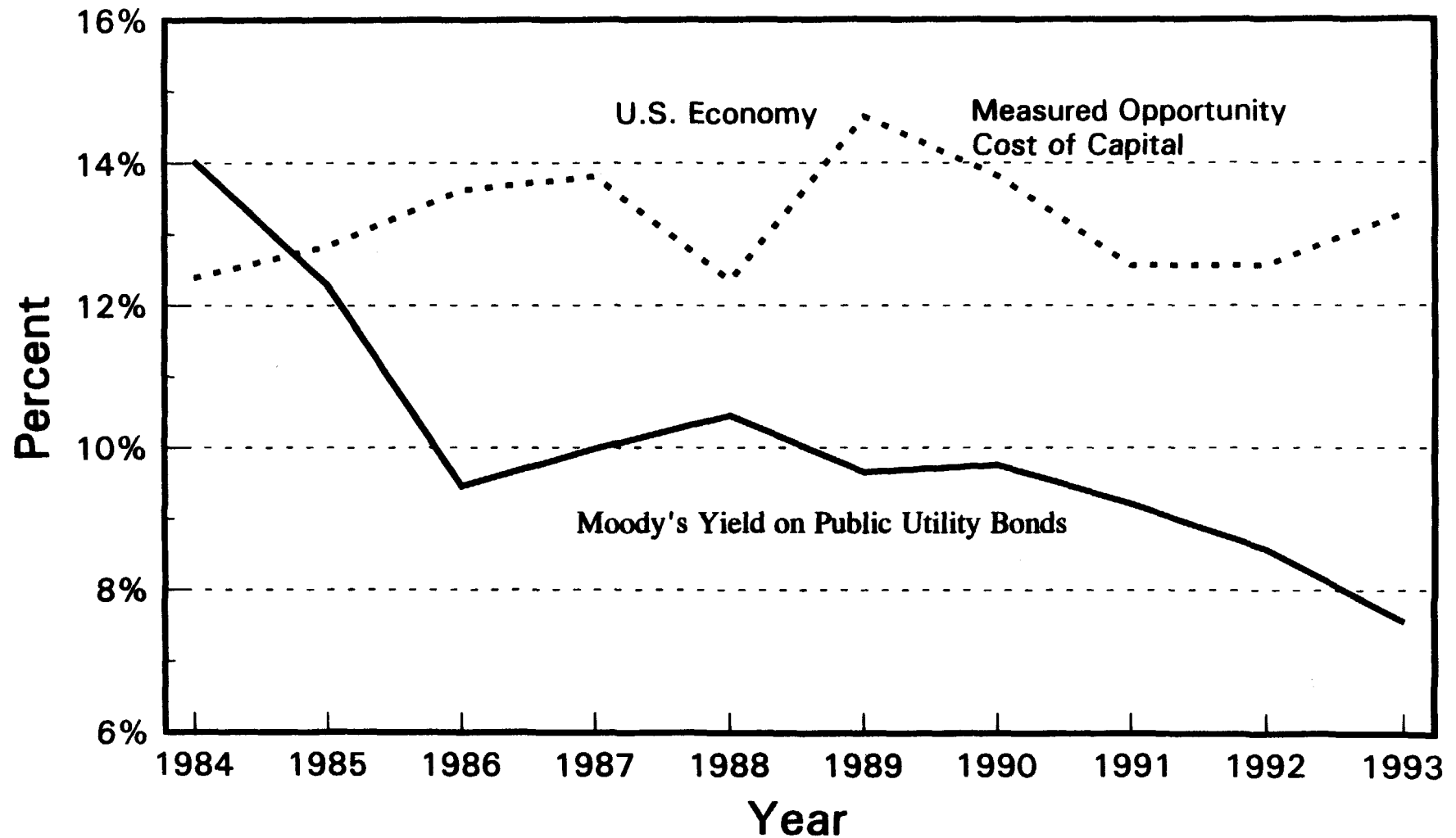|	Moody's Yield on Public Utility Bonds	30 Year Treasury Bonds
1984	14.03%	12.41%
1985	12.29%	10.79%
1986	9.46%	7.78%
1987	9.98%	8.59%
1988	10.45%	8.96%
1989	9.66%	8.45%
1990	9.76%	8.61%
1991	9.21%	8.14%
1992	8.57%	7.67%
1993	7.56%	6.59%

Moody's Yield on Public Utility Bonds: <u>Moody's Public Utility Manual</u>, various issues.

Thirty Year Treasury Bonds: <u>Economic Report of the President</u>, February 1994, Table B-72.

Exhibit F

U.S. Measured Opportunity Cost of Capital
Versus Moody's Yield on Public Utility Bonds

US Economy Measured Opportunity Cost of Capital Versus Moody's Yield on Public Utility Bonds 1984-1993

U.S. Economy

Measured Opportunity Cost of Capital

Moody's Yield on Public Utility Bonds

Percent

Year

US Economy Measured Opportunity Cost of Capital Versus Moody's Yield on Public Utility Bonds 1984-1993

	U.S. Economy	Moody's Yield
1984	12.39%	14.03%
1985	12.83%	12.29%
1986	13.62%	9.46%
1987	13.81%	9.98%
1988	12.35%	10.45%
1989	14.65%	9.66%
1990	13.82%	9.76%
1991	12.56%	9.21%
1992	12.56%	8.57%
1993	13.29%	7.56%

Measuring the U.S. Economy
Opportunity Cost of Capital

The U.S. economy opportunity cost of capital is not a directly observable number, but it can be measured by applying two economic relationships. The first economic relationship pertains to the National Income and Products Accounts definitions of Gross Domestic Product and the total cost of inputs used by the U.S. domestic economy. In the National Income and Products Accounts, the total cost of the U.S. economy inputs is equal to Gross Domestic Product. At the economy-wide level there are two inputs: labor and capital. Therefore the total cost of capital input is equal to Gross Domestic Product less Labor Compensation. We can represent this relationship by the equation:

$$CK = GDP - CL \tag{1}$$

where CK represents the total cost of capital, GDP gross domestic product, and CL labor compensation.

The second relationship is between the total cost of capital and the components of the capital price equation. The total cost of capital is equal to the product of the quantity of capital input and the price of capital input, or:

$$CK = P_k \cdot K \tag{2}$$

where P_k represents the price of capital input and K the quantity of capital input. Furthermore, the price of capital input can be decomposed into the price index for new plant and equipment (J), the opportunity cost of capital (r), the rate of depreciation (d), the inflation rate for new plant and equipment (I), and the rate of taxation on capital (t):

$$P_k = J \cdot (r + d - I + t) \qquad (3)$$

Combining (2) and (3) one obtains the relationship:

$$\begin{aligned} CK &= J \cdot (r + d - I + t) \cdot K \\ &= r \cdot J \cdot K + d \cdot J \cdot K - I \cdot J \cdot K + t \cdot J \cdot K \\ &= r \cdot VK + D - I \cdot VK + T \end{aligned} \qquad (4)$$

where D represents the total cost of depreciation, T total indirect business taxes and corporate profits taxes, and VK the current cost of plant and equipment net stock. Combining (1) and (4), one can derive the following equation for the opportunity cost of capital:

$$r = (GDP - CL - D - T + I \cdot VK)/(VK) \qquad (5)$$

Gross Domestic Product, labor compensation, depreciation, and taxes are reported annually in the National Income and Products Accounts. The current cost of plant

and equipment net stock and the inflation rate for plant and equipment are not reported in the National Income and Product Accounts, but are reported in a companion document published by the U.S. Bureau of Economic Analysis: Fixed Reproducible Tangible Wealth in the United States. Table 1 shows the calculation of the U.S. economy opportunity cost of capital.

Table 1
Derivation of U.S. Economy Opportunity Cost of Capital

Year	Gross Domestic Product	Labor Compensation	Depreciation	Taxes	Inflation Rate	Current Cost of Net Capital Stock	Opportunity Cost of Capital
1984	3777.2	2227.1	433.2	403.5	2.18%	6987.0	12.39%
1985	4038.7	2383.0	454.5	426.4	2.29%	7348.0	12.83%
1986	4268.6	2524.0	478.6	452.0	3.12%	7751.8	13.62%
1987	4539.9	2698.8	502.2	492.1	3.51%	8224.3	13.81%
1988	4900.4	2921.5	534.0	522.3	1.78%	8729.1	12.35%
1989	5250.8	3100.4	580.4	556.0	3.51%	9108.3	14.65%
1990	5546.1	3297.8	602.7	582.7	2.80%	9650.3	13.82%
1991	5724.8	3405.0	626.5	609.4	1.84%	10116.5	12.56%
1992	6020.2	3591.3	658.5	644.1	1.74%	10412.4	12.56%
1993	6343.3	3780.6	669.1	698.5	2.14%	10724.9	13.29%

Sources:

Gross Domestic Product: National Income and Product Accounts (NIPA), published in Survey of Current Business, Bureau of Economic Analysis, U.S. Department of Commerce, Table 1.1, line 1

Labor Compensation: NIPA 6.2, line 2

Depreciation: NIPA Table 1.9, line 5

Taxes: NIPA Table 1.9, line 9 plus Table 6.18, line 2

Inflation Rate: Based on Implicit Price of Fixed Private Capital Net Stock
Fixed Reproducible Tangible Wealth in the United States, 1925-1989, and annual updates, Tables A12 and A13.

Current Cost of Net Plant: Fixed Private Capital Net Stock, Current Cost Valuation, Fixed Reproducible Tangible Wealth in the United States, 1925-1989, and annual updates, Table A13.

Opportunity Cost of Capital: (GDP - Labor Compensation - Depreciation - Taxes + Inflation Rate*Current Cost of Net Plant)/Current Cost of Net Plant